

CLAIMS

We Claim:

1. A method comprising the steps of:
providing at least two plies, each ply having a first and a second opposing surface;
combining the at least two plies together to form a multi-ply web
treating either the first or the second opposing surface of at least one ply of the multi-ply web forming a treated multi-ply web wherein the treating process is selected from the group consisting of flexographic printing, rotogravure printing, offset printing, letterpress, direct gravure coating, offset gravure coating, reverse roll coating, flexographic coating, slot coating, dip coating, rod coating, knife coating, air knife coating, blade coating, slide coating, curtain coating, spraying, hot melt spraying, foam application, brushing, and embossing;
winding the treated multi-ply web into a roll;
changing the orientation of the treated surface within the multi-ply web to form a reoriented multi-ply web; and
unwinding the roll.
2. The method of claim 1 wherein the treating comprises applying a chemical to either the first or the second surface.
3. The method of claim 2 wherein the treating comprises printing a virucidal solution on either the first or second surface.
4. The method of claim 2 wherein the treating comprises printing an ink on either the first or second surface.
5. The method of claim 2 wherein the treating comprises printing a virucidal solution and printing an ink on either the first or the second opposing surface.
6. The method of claim 1 wherein the treating comprises embossing either the first or second opposing surface.
7. The method of claim 1 comprising attaching the plies together of the multi-ply web before winding the multi-ply web into a roll and wherein only a portion of a length of the multi-ply web is attached together within the wound roll and another portion of the length of the multi-ply web is not attached together within the wound roll.
8. The method of claim 7 wherein the attaching comprises crimping.
9. The method of claim 1 wherein the plies comprise the same material.
10. The method of claim 1 wherein the plies comprise different materials.

11. The method of claim 9 wherein the plies comprise either bath tissue, paper towels, or facial tissue.
12. The method of claim 10 wherein the plies comprise a tissue web and a nonwoven web.
13. The method of claim 1 comprising winding the multi-ply web into a second roll after changing the orientation of the treated surface.
14. The method of claim 1 comprising threading a machine after changing the orientation of the treated surface.
15. The method of claim 1 wherein the first surface of a first ply contacts the first surface of a second ply in the multi-ply web, and, after changing the orientation of the treated surface, the second surface of the first ply contacts the second surface of the second ply in a reoriented multi-ply web.
16. The method of claim 1 wherein changing the orientation of the treated surface comprises dropping a ply to form a reoriented multi-ply web.
17. The method of claim 16 comprising threading a machine with the reoriented multi-ply web.
18. The method of claim 1 wherein changing the orientation of the treated surface comprises:
 - unwinding a portion of the treated multi-ply web from the roll;
 - separating at least one ply from the unwound portion of the treated multi-ply web;
 - threading the separated at least one ply around a periphery of the roll;
 - bringing the separated at least one ply into contact with the remaining unwound portion of the treated multi-ply web to form a reoriented multi-ply web; and
 - threading a machine with the reoriented multi-ply web.
19. The method of claim 17 or 18 wherein the machine comprises a folding machine.
20. The method of claim 17 or 18 wherein the machine comprises a winder.
21. The method of claim 17 or 18 wherein the machine comprises a printer.
22. The method of claim 20 comprising crimping the reoriented multi-ply web.
23. The method of claim 22 comprising winding the reoriented multi-ply web into a second roll.
24. The method of claim 1 comprising forming a first reoriented multi-ply web as the roll is unwound, winding the first reoriented multi-ply web into a second roll, and changing

the orientation of the first reoriented multi-ply web as the second roll is unwound to form a second reoriented multi-ply web.

25. A method comprising the steps of:
 - combining a first outer ply, a middle ply, and a second outer ply forming a multi-ply web;
 - treating a surface of the first or the second outer ply forming a treated multi-ply;
 - winding the treated multi-ply web into a roll;
 - changing the orientation of the first or the second outer ply to become the middle ply of a reoriented multi-ply web; and
 - unwinding the roll.
26. The method of claim 25 wherein the treating comprises applying a chemical on the surface.
27. The method of claim 26 wherein the treating comprises applying a virucidal solution on the surface.
28. The method of claim 27 wherein the treating comprises printing a visual cue on the surface.
29. The method of claim 25 comprising threading a machine with the reoriented multi-ply web.
30. The method of claim 29 wherein changing the orientation of the first or second outer ply comprises dropping at least one of the plies.
31. The method of claim 26 wherein the orientation of the multi-ply web is intentionally changed to form the reoriented multi-ply web for each successive roll that is unwound during production in a manufacturing operation.
32. The method of claim 29 wherein changing the orientation of the first or the second outer ply comprises:
 - unwinding a portion of the treated multi-ply web from the roll;
 - separating at least one ply from the unwound portion of the treated multi-ply web;
 - threading the separated at least one ply around a periphery of the roll; and
 - bringing the separated at least one ply into contact with the remaining unwound portion of the treated multi-ply web to form a reoriented multi-ply web.

33. The method of claim 32 wherein the orientation of the multi-ply web is intentionally changed to form the reoriented multi-ply web for each successive roll that is unwound during production in a manufacturing operation.
34. The method of claim 29 comprising winding the reoriented multi-ply web into a second roll.
35. The method of claim 29 comprising treating at least one outside surface of the reoriented multi-ply web.
36. The method of claim 35 wherein the treating comprises applying a chemical.
37. The method of claim 36 wherein the treating comprises printing a polysiloxane composition onto both of the outside surfaces.
38. A method comprising the steps of:
 - combining a first outer ply having a felt side and a dryer side with a second outer ply having a felt side and a dryer side forming a multi-ply web wherein the felt sides of the first and second outer plies form both exterior surfaces of the multi-ply web;
 - treating at least one of the exterior felt side surfaces forming a treated multi-ply web;
 - winding the treated multi-ply web into a roll;
 - changing the orientation of the first or the second outer ply to form a reoriented multi-ply web wherein the dryer sides of the exterior plies form both exterior surfaces of the reoriented multi-ply web;
 - threading a machine with the reoriented multi-ply web; and
 - unwinding the roll.
39. The method of claim 38 comprising combining the first outer ply and the second outer ply with a middle ply.
40. The method of claim 38 wherein changing the orientation comprises dropping a ply.
41. The method of claim 39 wherein changing the orientation comprises dropping a ply.
42. The method of claim 38 wherein changing the orientation comprises:
 - unwinding a portion of the treated multi-ply web from the roll;
 - separating at least one ply from the unwound portion of the treated multi-ply web;
 - threading the separated at least one ply around a periphery of the roll; and
 - bringing the separated at least one ply into contact with the remaining unwound portion of the treated multi-ply web to form the reoriented multi-ply web.
43. The method of claim 39 wherein changing the orientation comprises:

- unwinding a portion of the treated multi-ply web from the roll;
 - separating the first outer ply and the middle ply from the second outer ply in the unwound portion of the treated multi-ply web;
 - threading the first outer ply and the middle ply around a periphery of the roll; and
 - bringing the first outer ply and middle ply into contact with the second outer ply of the treated multi-ply web to form the reoriented multi-ply web.
44. The method of claim 38 wherein the treating comprises applying a chemical to one or both of the exposed dryer sides.
45. The method of claim 44 wherein the treating comprises printing a virucidal solution to one or both of the exposed dryer sides.
46. The method of claim 45 wherein the treating comprises printing an ink to one or both of the exposed dryer sides.
47. A method comprising the steps of:
- providing at least two plies, each ply having a first and a second opposing surface;
 - combining the at least two plies together to form a multi-ply web;
 - winding the multi-ply web into a roll on a first converting machine;
 - transporting the roll to another location for treatment;
 - unwinding the multi-ply web on a second converting machine, treating either the first or the second opposing surface of the multi-ply web forming a treated multi-ply web, and winding the treated multi-ply web into a roll;
 - transporting the roll to another location;
 - changing the orientation of the treated surface within the multi-ply web forming a reoriented multi-ply web; and
 - threading a third converting machine with the reoriented multi-ply web.
48. The method of claim 47 wherein the first, second, and third converting machines are all located within one manufacturing facility.
49. The method of claim 47 wherein at least one of the first, second, or third converting machines is located in another manufacturing facility.
50. The method of claim 47 wherein the first and the third converting machines are located at one manufacturing facility and the second converting machine is located at another manufacturing facility.
51. The method of claim 47 wherein changing the orientation of the treated surface comprises dropping a ply.

52. The method of claim 47 wherein changing the orientation of the treated surface comprises:

- unwinding a portion of the treated multi-ply web from the roll;
- separating at least one ply from the unwound portion of the treated multi-ply web;
- threading the separated at least one ply around a periphery of the roll; and
- bringing the separated at least one ply into contact with the remaining unwound portion of the treated multi-ply web to form the reoriented multi-ply web.